PROJECT NAVIGATOR, LTD.

April 7, 2014

Mr. Charles David Abshire (6SF-AP)
Remedial Project Manager
U.S. Environmental Protection Agency
Region 6
1445 Ross Avenue
Dallas, TX 75202-2773

RE: Request for Approval
Addendum #1 – Phase One Remedial Action Work
United States of America and State of Texas v. Alcoa, Inc., et al.; CA No. 3:12-cv-00210
Malone Service Company Superfund Site - Texas City, TX

Dear David:

On behalf of the Malone Cooperating Parties (MCP), in compliance with and pursuant to the Consent Decree (CD) and Statement of Work (SOW) for Remedial Design/Remedial Action (RD/RA) at the Malone Service Company Superfund Site in Texas City, TX, this letter sets out and requests written EPA approval of Addendum #1 to the Phase One Remedial Action Work Plan.

As we have discussed, Addendum #1 requests approval to expedite installation of the slurry wall and the dewatering system and conduct the work during the Phase One RA. The slurry wall and dewatering system were originally scheduled for installation during Phase Two. However, shifting this work to Phase One will allow the MCP to begin dewatering operations as soon as possible prior to full-scale solidification operations and provide greater flexibility for remedial operations.

Attached please find Addendum #1 containing a description of the work, specifications for the slurry wall and the dewatering system and an updated Phase One RA schedule. Completing the slurry wall installation and dewatering system installation in Phase One is not expected to impact the start of Phase Two work. Table One attached shows the current and proposed division of remedy elements for Work Phases. Upon your authorization, a revised Phase One Work Plan will be provided, and the installation of these remedy elements will proceed. Should you have any questions please contact me.

Sincerely,

Bob Piniewski

Robert Piniewski
Project Coordinator

cc: Marilyn Long - TCEQ
Malone Cooperating Parties

703924

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Table One Malone Service Company Superfund Site Texas City, TX Proposed Revisions to Work Phases		
Phase #	**Current SOW Work**	**SOW Revised Work**

Phase One	• Pre-Design Investigations – Work Plan and Implementation
	  ○ Slurry Wall Investigation
	  ○ Sludge Pond Investigation
	  ○ RCRA Cell Investigation
	  ○ Building and Tank Investigation
	  ○ Additional Data Collection (if required)
	• Cemetery Relocation - Work Plan and Implementation
	• Treatability Pilot Study - Work Plan and Implementation
	• Above Ground Tank and Building Demolition
		• Pre-Design Investigations – Work Plan and Implementation
		  ○ Slurry Wall Investigation
		  ○ Sludge Pond Investigation
		  ○ RCRA Cell Investigation
		  ○ Building and Tank Investigation
		  ○ Additional Data Collection (if required)
		• Cemetery Relocation - Work Plan and Implementation
		• Treatability Pilot Study - Work Plan and Implementation
		• Above Ground Tank and Building Demolition
		• Design and Construction of Slurry Wall

Phase Two	• Design and Construction of Slurry Wall • Design and Construction of Sludge Pond Berm Improvements • Design and Construction of the RCRA Cell • Sludge Treatment and Consolidation • Soil Delineation, Excavation and Consolidation	• Design and Construction of Sludge Pond Berm Improvements • Design and Construction of the RCRA Cell • Sludge Treatment and Consolidation • Soil Delineation, Excavation and Consolidation
Phase Three	• Site grading, drainage, and revegetation • Confirmation of procedure used to abandon former injection well • Well logging and proper abandonment of the two (2) on-site hazardous waste injection wells, and the proper plugging, logging and abandonment of the onsite water supply well • Groundwater Monitoring Work Plan and Well Installation • Institutional Controls	• Site grading, drainage, and revegetation • Confirmation of procedure used to abandon former injection well • Well logging and proper abandonment of the two (2) on-site hazardous waste injection wells, and the proper plugging, logging and abandonment of the onsite water supply well • Groundwater Monitoring Work Plan and Well Installation • Institutional Controls

2.2.8 Barrier Wall Installation

A groundwater cut-off (slurry) wall will be constructed around the perimeter of the Earthen Impoundment by way of the slurry trenching technique to accomplish three main objectives:

- To cut-off the groundwater table which, when combined with an inward gradient to be created by way of a groundwater extraction system, will limit groundwater from entering the subsurface sludge while it is solidified. The corresponding ability to limit the deleterious effects of the groundwater will enhance the solidification process and reduce the overall amount of reagent needed.
- To limit the mobility of the solidification leachate by cutting off the groundwater as a potential mode of transport.
- To permit the removal of solidified sludge and placement of backfill materials without interference caused by groundwater

The slurry wall will be a minimum of 2-1/2 feet wide and keyed a minimum of 3 feet into the underling clay. The permeability of the slurry wall is designed to be 1×10^{-7} cm/sec (CQAPP, Table 1). The slurry trenching technique involves the maintaining of an open cut trench long enough to replace the removed trench spoils with an engineered fill, designed to provide a continuous low permeability soil column from existing grade to a pre-determined depth. Since an open trench has the natural tendency to slough or cave in, slurry consisting of a mixture of bentonite clay and water is pumped into the trench to resist the active earth pressures and keep the sidewalls of the trench open until the engineered fill can be placed.

To begin the process, a starter trench will be cut, as close to vertical as possible at a pre-determined location along the slurry wall alignment. As the trench is started, slurried bentonite will be pumped into the trench to support the sidewalls. The trench spoils will be excavated and staged alongside the slurry trench as the excavation is continued to full depth. As the spoils are excavated, they will naturally be mixed with the slurry from within the trench as a function of being below the slurry line. Once staged in a bermed fashion alongside the trench, the spoils will be thoroughly mixed with additional slurried bentonite from the trench to create ideal mixing conditions (e.g. to create the targeted 3 to 6 inch slump). Once sufficiently mixed, the spoils will then be dozer pushed or placed via a tracked excavator back into the trench, from behind the slope of the backfill face. This will allow the backfill to enter the trench by sliding down the forward face of the previously placed backfill, a requirement necessary to prevent lenses of slurry or higher permeability material from being incorporated within the backfill matrix. The bottom of the excavation and backfill slopes will be maintained a distance of 10 to 15 feet apart at the base of the trench by way of the excavator routinely cleaning out the bottom “key” of the trench. Drawing 22 illustrates this excavation and backfilling process.

The process of excavating and backfilling will continue around the entire perimeter of the earthen impoundment. Throughout the process, quality control testing of each aspect of construction will be performed as indicated in Table 1 of the approved Construction Quality Assurance Plan and as detailed in Specification Section 02395 (Soil-Bentonite Barrier Wall).

2.2.9 Groundwater Extraction System

The Earthen Impoundment currently has standing water located above the sludge pit material within the Earthen Impoundment. Additionally, a large portion of the sludge pit and oil pit sludge is located below the water table. A groundwater extraction system will be installed to lower the water table to allow this material to be solidified and relocated into the cell under dry conditions.

The sludge will be dewatered by first removing the standing water via portable pumps, then utilizing a groundwater extraction system to lower the water table within the limits of the slurry wall. The groundwater extraction system will consist of vacuum well points installed around the perimeter of the earthen impoundment to a depth of approximately twenty feet below the existing ground surface. Vacuum pumps will be connected to a 6 to 8 inch header pipe which will accept water from the well points. The vacuum pumps will then be used to pump water to the 1200 API Unit storage tank prior to disposal. During the Phase One RA, all extracted groundwater will be disposed of utilizing the onsite injection well. All groundwater extraction will be completed in accordance with Specification Section 02140 Dewatering & Drainage.

Spec Section	02140	Dewatering & Drainage
	02395	Soil-Bentonite Barrier Wall
Drawing #	20	Slurry Wall Alignment & Working Platform
	21	Slurry Wall Profile, Typical Sections, & Cap
	22	Slurry Wall Process Schematics
	23	Groundwater Gradient Control System

SECTION 02140
DEWATERING AND DRAINAGE

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

A. This section includes the minimum requirements for dewatering and related work as indicated on the drawings and as specified herein to complete the scope of work. The work consists of furnishing all labor, equipment, and materials and performing all operations as required to furnish, install, operate, monitor, and maintain temporary dewatering and drainage systems as necessary to lower the water table within the Earthen Impoundment as necessary to perform sludge solidification, sludge removal, and backfill activities. All collected water shall be handled in accordance with the Storm Water Management Plan (Appendix M of the General RD/RA Work Plan)

1.2 RELATED SECTIONS

A. Section 01300 – Submittals
B. Section 02200 – Solidification Field Pilot Study
C. Section 02270 – Storm Water / Decontamination Water Treatment
D. Section 02500 – Surveying

PART 2 PRODUCTS

2.1 MATERIALS

A. Provide casings, well screens, piping, fittings, pumps, power and other items required for dewatering systems.

B. Provide properly sized and graded sand and gravel filter around the well screen. Wrapping geotextile fabric directly around the well screen shall not be allowed.

C. When deep wells, well points, or vacuum well points are used, provide pumping units capable of maintaining high vacuum and handling large volumes of air and water at the same time.

D. Provide auxiliary dewatering equipment in the event of breakdown. Equipment shall consist of pumps and hoses and be stored on site.

E. Provide and maintain erosion and sedimentation control devices as indicated or specified.

F. Provide temporary pipes, hoses, flumes, or channels for the transport of discharge water to the storage location.

G. Water to be utilized for wellpoint installation will come from the freshwater pond.

PART 3 EXECUTION

3.1 GENERAL

A. Control surface water such that it does not flow outside the barrier wall perimeter. Provide temporary measures such as dikes, ditches, or berms as necessary.

B. Utilize a groundwater control system to lower the water table within the earthen impoundment.

C. Utilize portable pumps as necessary to control surface water or standing water within the earthen impoundment and/or soil excavation areas.

3.2 DEWATERING SYSTEM INSTALLATION

A. A wellpoint system will be used to control the groundwater within the area of the proposed barrier wall including the Earthen Impoundment. A minimum of 2" diameter wellpoints will be installed by jetting methods along the proposed alignment at the appropriate spacing and of sufficient depth to lower the groundwater to the bottom of the deepest solidification area.

B. Installed wellpoints shall be test pumped to assure the wellpoint was installed correctly and to develop the well.

C. Wellpoints shall be connected to a perimeter vacuum manifold via rubber hose connectors. Each wellpoint shall include a control valve and clear hose section for regulating and tuning the wellpoints.

D. The pumping system shall consist of wellpoint pumps capable of sustaining the necessary flow with at least one standby pump.

E. The discharge pipe will be routed to the API 1200 tank for staging prior to disposal. Alternate storage locations may be used as necessary.

3.3 DEWATERING SYSTEM OPERATION & MAINTENANCE

A. Prior to any excavation below the ground water table, place system into operation to lower water table as required and operate it continuously 24 hours a day, 7 days a week until the work has been satisfactorily completed, which includes

solidification of sludge, excavation, and placement of backfill materials below the normal water table.

B. Daily operation and maintenance activities shall include observation and recording of system flow, water table levels, system vacuums, and mechanical inspections.

3.4 EXCAVATION AREA DEWATERING

A. All facilities required to divert, collect, control, and remove water from all construction work areas and excavations will be furnished during excavation activities.

B. Dewatering equipment shall be provided to remove and dispose of surface and groundwater entering excavations. Each excavation shall be dewatered during subgrade preparation and continually thereafter until the excavation has been completed and backfill has been installed.

C. Nominal amounts of water seeping from the subgrade is to be expected during excavation. If the amount is water infiltrating is more than can be evacuated with wellpoints, mop points, isolated sumping/pumping, then a secondary wellpoint system may be necessary. If needed, that interior, lower system will be treated in every way the same as the initial perimeter system, as described within this Specification.

D. The discharge pipe from excavation dewatering will be routed to the API 1200 tank for staging prior to disposal. Alternate storage locations may be used as necessary.

3.5 REMOVAL

A. All mechanical components of the dewatering system or portion thereof shall be removed upon the completion of backfill. The well points will be cut-off and left in place.

END OF SECTION

SECTION 02395
SOIL-BENTONITE BARRIER WALL

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

This section includes the requirements for the installation of the soil-bentonite barrier wall and related work as indicated on the drawings and as specified herein. The work consists of furnishing all labor, equipment, materials, and performing all operations as required to construct the slurry trench cutoff wall as specified.

1.2 RELATED SECTIONS

A. Section 01300 – Submittals
B. Section 02500 – Surveying

1.3 SOIL-BENTONITE BARRIER WALL

The soil-bentonite barrier wall will be constructed to the lines, grades, and cross-sections as indicated on the drawings. The trench shall essentially consist of vertical walls, a minimum width of 2.5', and will extend through the overburden and site soils, and key a minimum of 3' into the underlying clay layer. The intent of the barrier wall is to provide a low permeability cutoff wall around the earthen impoundment for groundwater control purposes.

PART 2 PRODUCTS

2.1 MATERIALS

A. Slurry

Slurry shall consist of a stable colloidal suspension of bentonite in water and shall be controlled in accordance with the most current API Standard 13B, "Standard Procedure for Testing Drilling Fluids," and the following requirements:

1. At the time of introduction of the slurry into the trench, the slurry shall be a mixture of not less than 16 pounds per barrel (42 gallons) of bentonite and water. Additional bentonite and/or soda ash may be required depending on the hardness and temperature of the water and the quality of the bentonite. The slurry shall have a minimum apparent viscosity of 15 centipoises or 40-seconds reading through a Marsh Funnel Viscosimeter, a maximum filtrate loss of 25 cubic centimeters in 30 minutes at 100 psi, and a pH of not less than 7 and not greater than 10.

2. The slurry mixture in the trench shall have a unit weight not less than 64 pcf and not greater than 95 pcf.

3. The slurry mixed with backfill material shall be either slurry taken from the trench or slurry meeting the requirements of slurry introduced into the trench.

B. Bentonite

Based on the results of the Phase One Design Investigation Report, Slurry Wall Design Report, the bentonite used in preparing slurry shall be pulverized (powder) premium grade Hydrogel-90 manufactured by Wyo-Ben. This bentonite was selected due to its ability to remain in suspension when mixed with the proposed water from the fresh water pond.

C. Water

Water from the fresh water pond shall be used to manufacture bentonite slurry. Water shall not contain excessive amounts of deleterious substances that may adversely affect the properties of the slurry.

D. Additives

Admixtures of the type used in the control of oil-field drilling muds such as softening agents, dispersants, retarders or plugging or bridging agents may be added to the water or the slurry to permit efficient use of bentonite and proper workability of the slurry. However, no additives shall be used except as approved by the Design Engineer.

E. Backfill

The material for trench backfilling shall be composed of slurry and soils obtained from the trench excavation. The soil shall be free from roots, organic matter, or other deleterious materials. The backfill shall be thoroughly mixed. The fines into the backfill mix shall have sufficient plasticity so that the material can be rolled into a 1/8" thread without crumbling. The backfill shall be reasonably graded between the following gradation limits:

Screen Size (U.S. Standard)	Percent Passing by Dry Weight
3/8”	65-100
No. 200	>30

Material excavated from the trench is generally expected to meet the above requirements. Laboratory results indicated that trench excavated soils and bentonite slurry will provide an adequate reduction in permeability.

PART 3 EXECUTION

3.1 TRENCH EXCAVATION EQUIPMENT

Excavation of the slurry trench cutoff wall shall be accomplished by use of any suitable earth-moving equipment or combination thereof such as an extended-arm hydraulic excavator so that the required width trench can be carried to its final depth of cut continuously along the trench line. The width of the excavating tool shall be equal to or greater than the specified minimum width of the cutoff wall.

3.2 SLURRY BATCHING PLANT

The slurry batching plant shall include the necessary equipment including a mixer capable of producing a colloidal suspension of bentonite in water, pumps, valves, hoses, supply lines, and all other equipment as required to adequately supply slurry to the trench. All slurry for use in the trench shall be prepared using a suitable mixer. No slurry is to be made in the trench. Mixing of water and bentonite shall continue until bentonite particles are fully hydrated and the resulting slurry appears homogeneous.

3.3 BACKFILL MIXING AND PLACING EQUIPMENT

Equipment for mixing and placing backfill may consist of a suitable type of earthmoving or grading equipment, such as bulldozers, or blade graders, or blenders such as a pug mill, that are capable of thoroughly mixing the backfill materials into a homogeneous paste having the required gradation and properties and placing the material in the trench as specified herein.

3.4 SLURRY TRENCHING

Excavation shall be carried to final depth at the point where excavation is started and then the final depth of cut shall be carried along the line of the trench. Excavation shall proceed continuously from the starting point to the finishing point. Slurry shall be introduced into the trench at the same time trenching is begun and shall be maintained in the trench during excavation and until backfilled. The stability of the excavated trench shall be maintained at all times for its full depth. The level of bentonite slurry shall always remain at least 3’ above groundwater level and shall not be permitted to drop more than 2' below the surface of the slurry trench working platform. Personnel, equipment, and materials shall be ready to raise the slurry level at any time.

3.5 KEY

Unless otherwise directed by the Design Engineer, the bottom of the slurry trench will be keyed a minimum of 3’ into the underlying clay formation as indicated by soil borings or

trench cuttings. The depth to the clay key and the final depth and penetration of the trench shall be measured and checked by the Slurry Trench Specialist and Quality Control Representative immediately following excavation at a minimum frequency of once per every 10 lineal feet of trench.

3.6 CLEANING TRENCH BOTTOM

Upon completion of each excavation set (typically 30' to 40' long), any loose material or cuttings shall be removed from the bottom of the trench with the excavation tools or other suitable means. The Slurry Trench Specialist and Quality Control Representative shall verify that the trench bottom has been cleaned of all granular material prior to allowing backfill placement. The depth to the clay key and total trench depth shall be measured and recorded every 10' as the trench excavation advances. Backfill slope profile soundings and trench backfill bottom soundings will be measured at the start and the end of each shift, and in events where trench backfill operations are suspended for more than 2 hours. If the soundings indicate a difference of more than 6" to those previously recorded, trench cleaning will be done prior to additional backfill placement. If the unit weight of the slurry in the trench exceeds the specified limits or becomes unworkable, the heavy slurry shall be removed from the trench.

3.7 BACKFILL MIXING

Material from borrow shall be mixed and blended in mechanical blenders or by windrowing, disk harrowing, bulldozing, blading or by other approved methods. Mixing and blending shall be performed in such a manner as to produce the required gradation of backfill. The backfill material shall be thoroughly mixed into a homogeneous mass, free from large lumps or pockets of fines or sands. Occasional lumps of up to 6" in their largest dimension will be permitted. Just prior to placing, the backfill material shall have a slump of 2" to 6". To this end, the material shall be sluiced with slurry during blending operations. Sluicing with water will not be permitted.

3.8 BACKFILL PLACEMENT

The backfill shall be placed continuously from the beginning of the trench, in the direction of the excavation, to the end of the trench. The toe of the slope of the trench backfill shall not be more than 30' following the toe of the excavation, or as required to permit inspection and measurement. Placing operations shall proceed in such a fashion that the surface of the backfill below the slurry wall follow a reasonably smooth grade and shall not have hollows, which may trap pockets of slurry during subsequent backfilling. Free dropping of backfill material through the slurry will not be permitted. Initial backfill shall be placed by excavating a "lead-in trench" within the slurry wall alignment. The "lead-in trench" will be excavated to a slope of approximately 1:1. Initial backfill will be placed in such a manner that the backfill enters the trench sliding down the lead-in slope until the backfill rises above the surface of the slurry trench. Additional backfill may then be placed in such a manner that the backfill enters the trench by sliding down the forward face of the previously placed backfill. To accomplish this, sufficient

backfill shall be piled on the edge of the existing backfill to cause a slump and sliding action on the face of the in-place backfill. The backfill shall not be dropped or deposited in any manner that will cause segregation.

3.9 TREATMENT FOR TOP OF TRENCH

Upon completion of backfill placement, and before drying of the backfill can occur, the trench shall be capped with a 2' thick (minimum) clay cap as shown on the drawings.

3.10 CLEAN-UP

After completion of the backfill and capping, all remaining excavated material and slurry shall be spread over proposed soil excavation areas.

3.11 QUALITY CONTROL

Quality control shall be performed in accordance with these Specifications and Table 1 of the Construction Quality Assurance Plan included as part of the General RD/RA Work Plan. All laboratory permeability testing of the backfill shall be performed by a third party.

3.12 TRENCHING CONTINUITY AND KEY

The trench shall be continuous and keyed the minimum specified depth into the underlying aquiclude. Trench continuity shall be assured by the action of movement of the trench excavation equipment such that the digging tools can be passed vertically from top to bottom of the trench, as well as moved horizontally along the axis of the trench without encountering unexcavated material. Penetration of the bottom of the trench into the aquiclude shall be demonstrated by observation of the cuttings removed from the trench and by direct measurement of trench depth by the Slurry Trench Specialist and Quality Control Representative.

3.13 SLURRY AND BACKFILL

Testing requirements for slurry and backfill are as follows:

A. Bentonite:

Certification of compliance with the specifications shall be obtained from the material manufacturer.

B. Slurry Introduced in the Trench

A complete series of tests shall be conducted on slurry introduced in the trench at least twice per shift. Filtrate loss test frequency can be reduced to one per week

once 3 consecutive passing tests are achieved and no failing tests are encountered. These tests shall include:

- Unit weight of the slurry by Mud Balance (API Standard 13B-1)
- Filtrate loss of the slurry (API Standard 13B-1)
- Viscosity of the slurry (API Standard 13B-1)
- pH of the slurry (API Standard 13B-1)

C. Slurry in the Trench

Slurry in the trench shall be tested at least twice per shift. Samples shall be obtained from near the bottom of the trench near the point of trenching. These tests shall include:

- Unit weight of the slurry by Mud Balance (API Standard 13B-1)
- Viscosity of the slurry (API Standard 13B-1)

D. Backfill Mix

A complete series of tests shall be conducted on backfill to be placed in the trench. The tests shall include:

- Slump (ASTM C-143)
- Coefficient of permeability (ASTM D-5084)
- Density (ASTM C138 or D4380 mod)

3.14 DOCUMENTATION

Top of key elevations will be compared to working platform elevations and depth of cut elevations to provide additional information on actual key depths.

Results of all tests performed in accordance with the specifications will be recorded on forms acceptable to the Contractor and the Owner, and signed by the Quality Control Representative. These forms will be available to the at all times for inspection.

END OF SECTION

LEGEND:

- EXISTING GRADE CONTOUR — 10
- TOP OF SLURRY WALL WORK PLATFORM CONTOUR — 10
- EXISTING GRAVEL/PAVED ROAD
- EXISTING DIRT ROAD
- EXISTING DIRT PILE
- EXISTING STRUCTURE
- EXISTING TANK
- EXISTING PIPELINE
- EXISTING WATER SURFACE
- EXISTING FENCE LINE
- EXISTING POWER POLE
- EXISTING MANHOLE
- PROPOSED SLURRY WALL ALIGNMENT — 2+00
- DIFFERENCE BETWEEN EXISTING GRADE AND TOP OF SLURRY WALL WORK PLATFORM — 0.5 (– INDICATES CUT) / 0.5 (+ INDICATES FILL)

NUMBER INDICATES DETAIL
LETTER INDICATES ELEVATION OR SECTION

INDICATES SHEET WHERE DETAIL, ELEVATION OR SECTION IS DEPICTED
(– INDICATES SAME SHEET)

INDICATES SHEET WHERE DETAIL, ELEVATION OR SECTION IS FIRST REFERENCED
(– INDICATES SAME SHEET)

Slurry Wall Work Platform Volume Report		
	Cut (cy)	Fill (cy)
Existing grade vs. 50 ft. wide work platform:	1,845	990

NOTES:

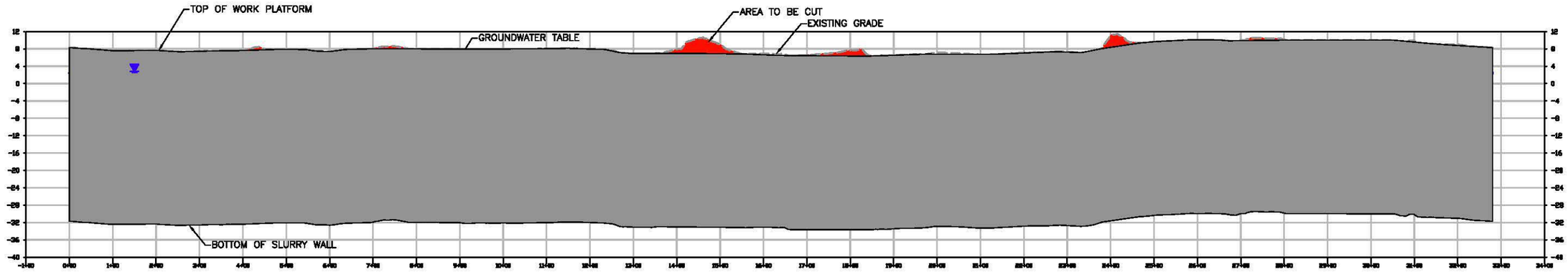
1. THIS DRAWING WAS CREATED BASED ON PHOTOGRAMMATIC SURVEY DATA COLLECTED BY DALLAS AERIAL SURVEYS, INC. ON 10/29/10 AS REQUESTED BY ENTACT.

REV	DATE	BY	CHK'D	APP'VD	DESCRIPTION

ENTACT
699 South Friendswood Dr., Suite 101
Friendswood, Texas 77546
P: 281-996-9892

DRAWING NAME: DRAWING 20
PROJECT NAME & LOCATION: PROPOSED SLURRY WALL ALIGNMENT AND WORKING PLATFORM
MALONE SERVICE COMPANY SUPERFUND SITE
TEXAS CITY, TEXAS

DRAWN BY	J. HOUGH	APPROVED BY	E. GEHRINGER	REV	
DATE	10-23-12	DATE	10-23-12	SHEET NO.	1 OF 1
DRAWING NO.	20	FIGURE NO.		PROJECT NO.	E7888

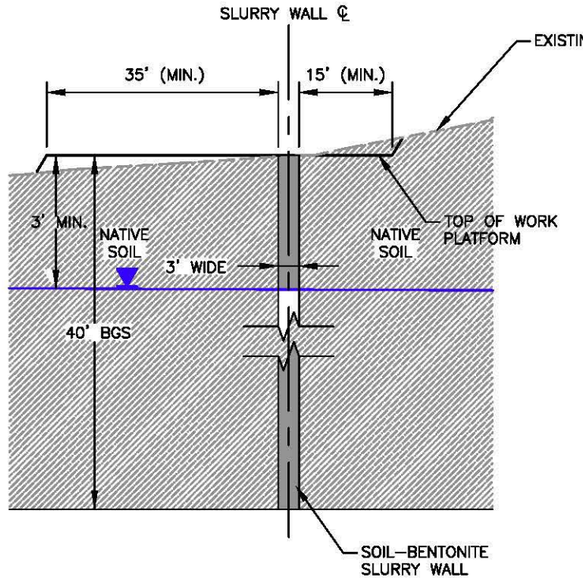


Slurry Wall Profile

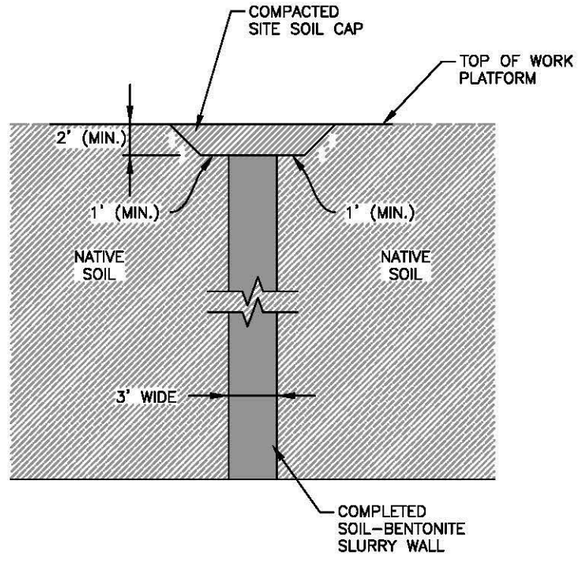
HORIZONTAL SCALE
0' 120' 240' 360'

VERTICAL SCALE
0' 12' 24' 36'

LEGEND:
SOIL–BENTONITE SLURRY WALL
EXISTING GRADE
TOP OF WORK PLATFORM



A 10|11 B 10|11 C 10|11 D 10|11 TYPICAL SLURRY WALL SECTION (N.T.S.)



1 10|11 TYPICAL SOIL–BENTONITE SLURRY WALL CAP DETAIL A/B/C/D (N.T.S.)

NOTES:

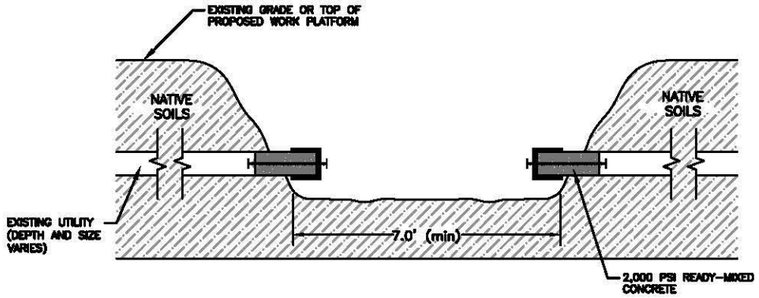
1. THIS DRAWING WAS CREATED BASED ON PHOTOGRAMMATIC SURVEY DATA COLLECTED BY DALLAS AERIAL SURVEYS, INC. ON 10/29/10 AS REQUESTED BY ENTACT.

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION

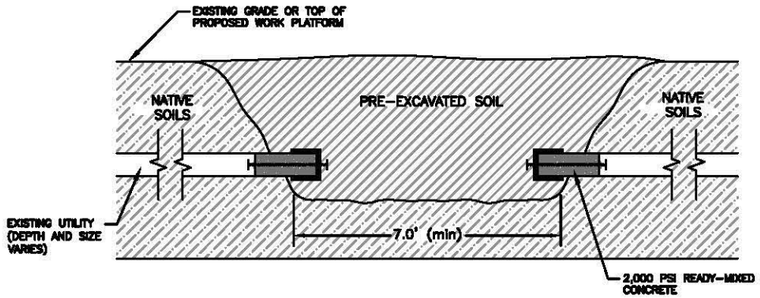
ENTACT
699 South Friendswood Dr., Suite 101
Friendswood, Texas 77546
P: 281-996-9892

DRAWING NAME: DRAWING 21
PROPOSED SLURRY WALL PROFILE, TYP SECTIONS AND CAP
PROJECT NAME & LOCATION: MALONE SERVICE COMPANY SUPERFUND SITE
TEXAS CITY, TEXAS

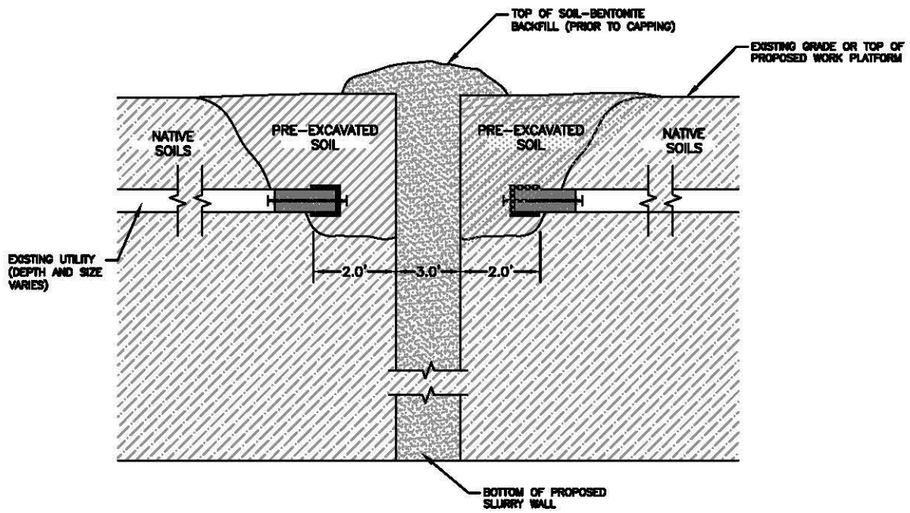
DRAWN BY	J. HOUGH	APPROVED BY	E. GEHRINGER	REV	
DATE	10-23-12	DATE	10-23-12	SHEET NO.	1 OF 1
DRAWING NO.	21	FIGURE NO.		PROJECT NO.	E7888



STEP 1: DRY EXCAVATION TO LOCATE, CUT, AND PLUG SUBSURFACE UTILITIES PRIOR TO CUT-OFF WALL INSTALLATION
(N.T.S.)

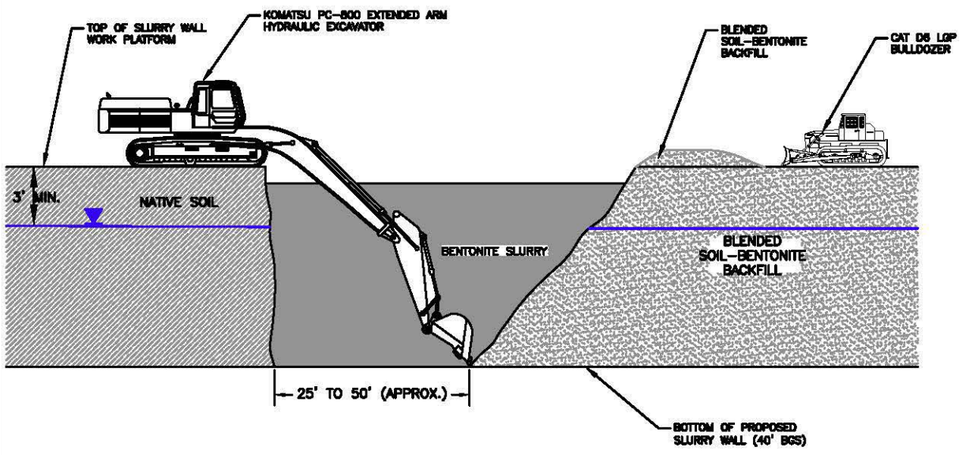


STEP 2: RE-BACKFILLING AND COMPACTION OF EXCAVATION AREA UPON CONCRETE CURING
(N.T.S.)

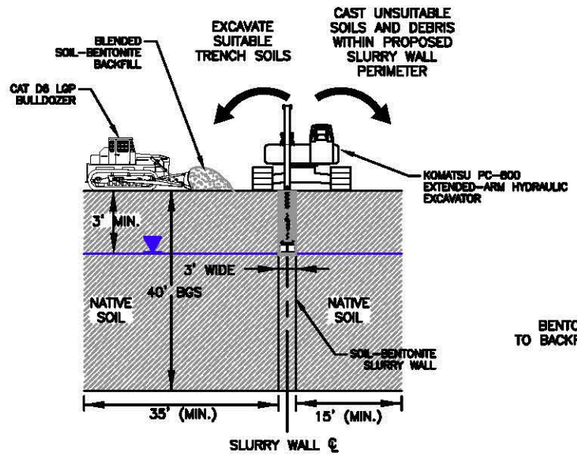


STEP 3: CUT-OFF WALL EXCAVATION AS SPECIFIED
(N.T.S.)

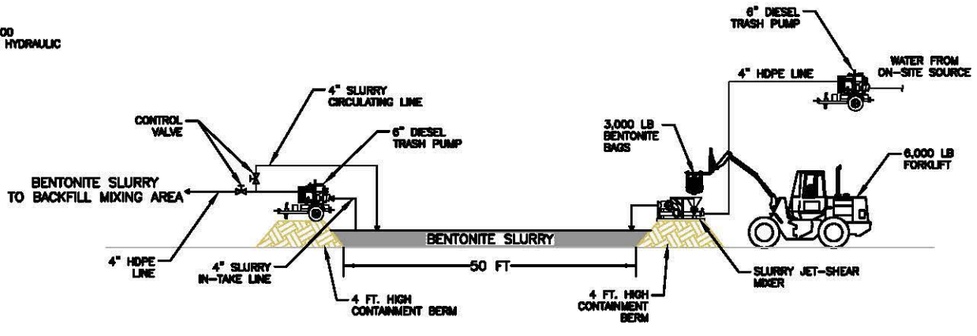
TYPICAL SLURRY WALL INSTALLATION SEQUENCE UPON UTILITY ABANDONMENT



TYPICAL SOIL-BENTONITE SLURRY WALL CONSTRUCTION SCHEMATIC
(N.T.S.)



TYPICAL SLURRY TRENCH EXCAVATION
(N.T.S.)



TYPICAL SLURRY PREPARATION SCHEMATIC
(N.T.S.)

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION

ENTACT
699 South Friendswood Dr., Suite 101
Friendswood, Texas 77546
P: 281-996-9892

DRAWING NAME: DRAWING 22
PROPOSED SLURRY WALL PROCESS SCHEMATICS

PROJECT NAME & LOCATION: MALONE SERVICE COMPANY SUPERFUND SITE
TEXAS CITY, TEXAS

DRAWN BY	J. HOUGH	APPROVED BY	E. GEHRINGER	REV	
DATE	10-23-12	DATE	10-23-12	SHEET NO.	1 OF 1
DRAWING NO.	22	FIGURE NO.		PROJECT NO.	E7888

SCALE
0' 60' 120' 180'

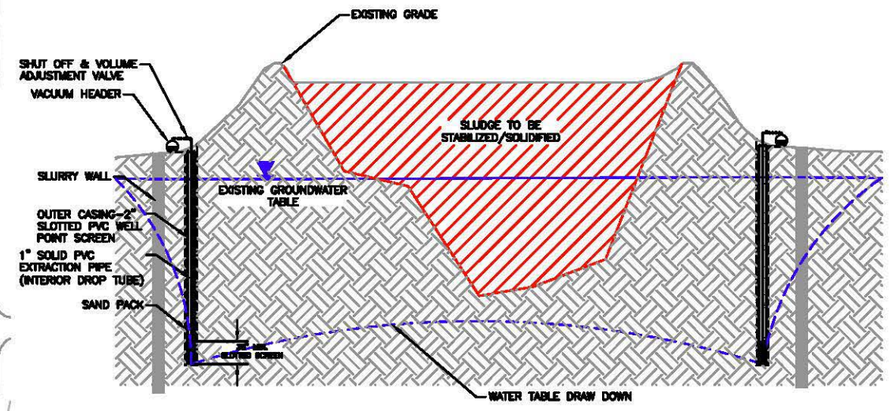
LEGEND:

- EXISTING GRADE CONTOUR
- BOTTOM OF SLUDGE CONTOUR
- EXISTING GRAVEL/PAVED ROAD
- EXISTING DIRT ROAD
- EXISTING DIRT PILE
- EXISTING STRUCTURE
- EXISTING TANK
- EXISTING PIPELINE
- EXISTING WATER SURFACE
- EXISTING FENCE LINE
- EXISTING POWER POLE
- EXISTING MANHOLE
- SLURRY WALL ALIGNMENT
- DEWATERING WELL POINT
- VACUUM HEADER PIPE
- GROUNDWATER CONTOUR
- MONITORING WELL

NUMBER INDICATES DETAIL
LETTER INDICATES ELEVATION OR SECTION

INDICATES SHEET WHERE DETAIL, ELEVATION OR SECTION IS DEPICTED (– INDICATES SAME SHEET)

INDICATES SHEET WHERE DETAIL, ELEVATION OR SECTION IS FIRST REFERENCED (– INDICATES SAME SHEET)



A/13 – TYPICAL WELLPOINT DEWATERING SECTION (N.T.S.)

NOTES:

1. THIS DRAWING WAS CREATED BASED ON PHOTOGRAMMATIC SURVEY DATA COLLECTED BY DALLAS AERIAL SURVEYS, INC. ON 10/29/10 AS REQUESTED BY ENTACT.

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION
A	12-10-12	JH	GT	GT	ADDED MONITORING WELL LOCATIONS

ENTACT
699 South Friendswood Dr., Suite 101
Friendswood, Texas 77546
P: 281-996-9892

DRAWING NAME: DRAWING 23
GROUNDWATER GRADIENT CONTROL SYSTEM

PROJECT NAME & LOCATION: MALONE SERVICE COMPANY SUPERFUND SITE
TEXAS CITY, TEXAS

DRAWN BY	J. HOUGH	APPROVED BY	E. GEHRINGER	REV	
DATE	10-23-12	DATE	10-23-12	SHEET NO.	1 OF 1
DRAWING NO.	23	FIGURE NO.		PROJECT NO.	P7888

Malone Service Company Superfund Site
Preliminary Phase One RA Schedule
04/01/14 Update

Activity ID	Description	Early Start	Early Finish	Original Duration
Malone Service Company Superfund Site				
General Activities				
2080	Phase One RA Work Plan Approval	21MAR14 *		0
Phase One RA Activities				
2090	Project Pre-Mobilization Planning & Procurement	21MAR14	05APR14	14
2095	Mobilize for Remedial Action Activities	07APR14	12APR14	6
2110	Install Erosion & Sedimentation Controls	14APR14	17APR14	4
2120	Improve Access Roads	09APR14	10APR14	2
2130	Remove Water From Sludge Pit (If Necessary)	14APR14	19APR14	6
2135	Perform Oil Pit Field Pilot Study	21APR14	24APR14	4
2140	Perform Sludge Pit Field Pilot Study	25APR14	03MAY14	8
2160	Perform Asbestos Abatement	14APR14	24APR14	10
2170	Perform Universal/Hazardous Waste Removal	15APR14	16APR14	2
2180	Perform Laboratory Chemical Removal	17APR14	18APR14	2
2185	Demolish Buildings	25APR14	06MAY14	10
2195	Tank Demolition	15APR14	13MAY14	25
2290	Concrete Demolition	14MAY14	27MAY14	10
2300	Well Abandonment	22APR14	07MAY14	14
2310	Prepare Pilot Study Report	05MAY14	30JUL14	70
2320	Submit Pilot Study Report to EPA/TCEQ	31JUL14		0
2325	EPA/TCEQ Approval on Phase One RA Addendum	02MAY14 *		0
2330	Install Barrier Wall Around Earthen Impoundment	02MAY14	07JUN14	30
2400	Install Dewatering System	28MAY14	20JUN14	21
2410	Operate Dewatering System	21JUN14	04NOV14	112
Phase Two RD/RA Activities				
2340	Prepare Phase Two RD/RA Work Plan	20JUN14	20AUG14	50
2350	Submit Phase Two RD/RA Work Plan to EPA/TCEQ	21AUG14		0
2360	EPA/TCEQ Review Phase Two RD/RA Work Plan	21AUG14	10OCT14	42
2370	Response to Phase Two EPA/TCEQ Comments	11OCT14	22OCT14	10
2380	EPA/TCEQ Approval of Phase Two RD/RA Work Plan	23OCT14	03NOV14	10
2390	Start of Phase Two Activities	04NOV14		0